

WHAT IS CLAIMED IS:

1. A ferroelectric liquid crystal display, comprising:

an upper substrate provided with a transparent electrode and an alignment film;

a lower substrate opposed to the upper substrate and provided with a pixel

5 electrode and an alignment film; and

a ferroelectric liquid crystal injected between the upper and lower substrates and containing a small amount of photo crosslinkable or light-hardening polymer to form a polymer network.

10 2. The ferroelectric liquid crystal display according to claim 1, wherein a temperature during injection of the ferroelectric liquid crystal is above a temperature causing a phase transition from a smectic phase into a nematic phase.

3. The ferroelectric liquid crystal display according to claim 1, wherein a direct current voltage is applied to the electrodes of the upper and lower substrates when the ferroelectric liquid crystal is uniformly aligned.

15 4. The ferroelectric liquid crystal display according to claim 1, wherein a temperature is varied after injection of the ferroelectric liquid crystal such that the ferroelectric liquid crystal is changed from a nematic phase into a smectic phase at least once when the ferroelectric liquid crystal is uniformly aligned.

20 5. The ferroelectric liquid crystal display according to claim 1, wherein the photo crosslinkable or light-hardening polymer forms a polymer network when exposed to a light intensity range of an ultraviolet light of about 1 to about 5mW/cm².

25 6. The ferroelectric liquid crystal display according to claim 1, wherein the photo crosslinkable or light-hardening polymer forms a polymer network when exposed to ultraviolet light such that a range of total exposure energy of the ultraviolet light exposed when the polymer is formed is about 240 to about 1200mJ/cm².

7. The ferroelectric liquid crystal display according to claim 5, wherein an ultraviolet lamp for generating the ultraviolet light is selected from any one of a Hg lamp and a Xe lamp.

8. The ferroelectric liquid crystal display according to claim 6, wherein an ultraviolet lamp for generating the ultraviolet light is selected from any one of a Hg lamp and a Xe lamp.

9. The ferroelectric liquid crystal display according to claim 7, wherein a wavelength range of the ultraviolet light is about $365 \pm 100\text{nm}$.

10. The ferroelectric liquid crystal display according to claim 8, wherein a wavelength range of the ultraviolet light is about $365 \pm 100\text{nm}$.

11. A method of fabricating a ferroelectric liquid crystal display, comprising the steps of:

joining an upper substrate provided with a transparent electrode and an alignment film to a lower substrate opposed to the upper substrate and provided with a pixel electrode and an alignment film;

injecting a ferroelectric liquid crystal having a photo crosslinkable or light-hardening polymer between the joined upper and lower substrates;

uniformly aligning the ferroelectric liquid crystal; and

exposing an ultraviolet light to the uniformly aligned ferroelectric liquid crystal.

12. The method according to claim 11, wherein a temperature upon injection of the ferroelectric liquid crystal is above a temperature which causes a phase transition from a smectic phase into a nematic phase.

13. The method according to claim 11, wherein a direct current voltage is applied to the electrodes of the upper and lower substrates when the ferroelectric liquid crystal is uniformly aligned.

14. The method according to claim 11, wherein a temperature is varied such that the ferroelectric liquid crystal is changed from a nematic phase into a smectic phase at least once when the ferroelectric liquid crystal is uniformly aligned.

15. The method according to claim 11, wherein a light intensity range of an ultraviolet light exposed when the polymer network is formed is about 1 to about 5mW/cm².

16. The method according to claim 11, wherein a range of total exposure energy of the ultraviolet light exposed when the polymer is formed is about 240 to about 1200mJ/cm².

17. The method according to claim 11, wherein an ultraviolet lamp for generating the ultraviolet light is selected from any one of a Hg lamp and a Xe lamp.

18. The method according to claim 17, wherein a wavelength range of the ultraviolet light is about 365 ± 100nm.

19. A ferroelectric liquid crystal cell, comprising:

an upper substrate provided with a common electrode and an alignment film;

a lower substrate provided with a TFT array layer and an alignment film; and

a ferroelectric liquid crystal provided in a space between the upper and lower substrates and containing photo crosslinkable or light-hardening polymer.

20. The ferroelectric liquid crystal cell according to claim 19, wherein the ferroelectric liquid crystal has a phase selected from one of an isotropic phase and a nematic phase.

21. The ferroelectric liquid crystal cell according to claim 20, wherein the ferroelectric liquid crystal is phase-changed from a nematic phase into a smectic phase and simultaneously aligned in the direction of one of the two states.

22. The ferroelectric liquid crystal cell according to claim 19, wherein a direct current voltage is applied to the upper and lower substrates while slowly lowering a temperature of the ferroelectric liquid crystal.

23. The ferroelectric liquid crystal cell according to claim 19, wherein an ultraviolet light is exposed to the ferroelectric liquid crystal to make a polymer network.

24. The ferroelectric liquid crystal cell according to claim 23, wherein a light intensity range of the ultraviolet light exposed when the polymer network is formed is about 1 to
5 about 5mW/cm².

25. The ferroelectric liquid crystal cell according to claim 23, wherein a total exposure energy ranged of the ultraviolet light is about 240 to about 1200 mJ/cm².

26. The ferroelectric liquid crystal cell according to claim 23, wherein an ultraviolet lamp for generating the ultraviolet light is selected from any one of a Hg lamp and a Xe
10 lamp.

27. The ferroelectric liquid crystal cell according to claim 23, wherein a wavelength range of the ultraviolet light is about $365 \pm 100\text{nm}$.

28. The ferroelectric liquid crystal cell according to claim 19, wherein when a temperature of the ferroelectric liquid crystal is lowered to a temperature which causes
15 a phase change into a smectic phase, the ferroelectric liquid crystal is uniformly aligned.